**Arab Academy for Science & Technology and Maritime Transport**
College of Engineering & Technology

**Department of ARCHITECTURAL ENGINEERING**
***Smart Village Campus***

# EC210 Solid State Electronics **Fall** 2013

## Course Outline

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| **Instructor:** | TA. Mostafa fidawy |
| **E-mail:** | m.fedawy@gmail.com |
| **Office:** | |
| **Off. Hrs:** | |
| **GTA:** | |
| **E-mail:** | |
| **Office:** | |
| **Off. Hrs:** | |
| **Objective:** | Understanding the basic fundamentals of solid state electronics such as:<br>Binding energy, crystal structure, quantum mechanics, band theory of solids and semiconductors. |
| **Text:** | S. O. Kasap, " Principles of Electronic Materials and Devices", 2002, McGraw-Hill |
| **Grading:** | Evaluating system<br>1- 7th Week Exam 30 marks<br>2- 12th Week Exam 20 marks<br>3- Tutorial Activity 10 marks<br>4- Final Exam 40 marks<br>Total 100 marks |

| Week of | | E V E N T | |
|---|---|---|---|
| 1 | Sept.22nd | **Lecture** | Introduction + General bonding principles |
| | | **Tutorial** | Sheet 1: Crystal structure |
| 2 | Sept.29th | **Lecture** | Covalently bonded solids, ionic, metallic, Miller Indices, and Crystal directions and planes |
| | | **Tutorial** | Sheet 1: Crystal structure |
| 3 | Oct.6th | **Lecture** | Particles and waves |
| | | **Tutorial** | Sheet 2: Particles and Waves |
| | Oct.13th | **Holiday** | **Al-Adha Feast** |
| 4 | Oct.20th | **Lecture** | Particles and waves |
| | | **Tutorial** | Sheet 2: Particles and Waves **+Quiz No. 1 (5 marks)** |
| 5 | Oct.27th | **Lecture** | **Wave Particle Duality** |
| | | **Tutorial** | Sheet 3 Wave Particle Duality + **Quiz No. 2 (5 marks)** |
| 6 | Nov.3rd | **Lecture** | **Quantum Mechanics: Photons and Photoelectric effect** |
| | | **Tutorial** | Sheet 3 Wave Particle Duality |
| 7 | Nov.10th | **Lecture** | **Seventh Exam (20 marks)** |
| | | **Tutorial** | **Revision** |
| 8 | Nov.17th | **Lecture** | **Time-independent Schrodinger equation** |
| | | **Tutorial** | Sheet 4: Quantum Mechanics (I) |
| 9 | Nov.24th | **Lecture** | Infinite potential well: A confined electron |
| | | **Tutorial** | Sheet #4: Quantum Mechanics (I) |
| 10 | Dec.1st | **Lecture** | Tunneling phenomenon |
| | | **Tutorial** | Sheet #5 : Quantum Mechanics (II) |
| 11 | Dec.8th | **Lecture** | Band Theory of Solids, |
| | | **Tutorial** | Sheet #5 : Quantum Mechanics (II ) + **Quiz No. 3 (5 marks)** |
| 12 | Dec.15th | **Lecture** | **Twelfth Exam (15 marks)** |
| | | **Tutorial** | **Revision** |
| 13 | Dec.22nd | **Lecture** | Semiconductors |
| | | **Tutorial** | Sheet #6 :Semiconductor |
| 14 | Dec.29th | **Lecture** | Semiconductors |
| | | **Tutorial** | Sheet #6 |
| 15 | Jan.5th | **Lecture** | Semiconductors |
| | | **Tutorial** | Revision |
| 16 | Jan.12th | **Final Exam** | |

Good Luck